

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Raymond A. Neff

Serial No. : 10/606,825

Filed : June 26, 2003

Atty. No : 12148

Title : VISCOELASTIC POLYURETHANE FOAM

Art Unit : 1796

Examiner : John M. Cooney

REPLY BRIEF

Mail Stop Appeal Brief - Patents

Commissioner of Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Dear Sir:

In response to the Examiner's Answer dated April 18, 2008, Applicant now submits a reply brief in accordance with 37 C.F.R. §41.41.

Status of Claims

Claims 1, 4-5, 7-18, 20-24, 48, 51-52, and 54-58 are attached hereto in the Claims Appendix. Claims 1, 4-5, 7-18, 20-24, 48, 51-52, and 54-58 stand finally rejected under 35 U.S.C. §103(a) and are the subject of this appeal.

Grounds of Rejection to be Reviewed on Appeal

Rejection of claims 1, 4-5, 7-18, 20-24, 48, 51-52, and 54-58 as unpatentable under 35 U.S.C. §103(a) over Lutter et al. (United States Patent No. 5,420,170).

Argument

Applicant respectfully submits that the Examiner has mischaracterized Applicant's position set forth in the Appeal Brief. In the Examiner's Answer, page 6, the Examiner contends that Applicant argued in the Appeal Brief at page 19, line 5, that the exemplified embodiment of Lutter et al. cited by Applicant correlates to the glass transition values within the ranges of values claimed. The Examiner mischaracterizes the context in which this portion was discussed by the Applicant and mischaracterizes the disclosure of Lutter et al. Lutter et al. is silent as to the glass transition temperatures of the foam formed therefrom. When the cited portion is read in context with the Declaration of Dr. Neff, it is clear that Applicant undertook to determine the properties of the foams set forth in the examples of Lutter et al. Example 6 of Lutter et al. was the closest example to the claimed invention and employed 6 parts by weight of the chain extender in the formation of the viscoelastic polyurethane foam.

Lutter et al. is silent as the glass transition temperature because the glass transition temperature is of little or no significance when used as a sound absorbing material and thus it was not desirable to adjust the glass transition temperature of Lutter's foam. It is once again submitted that adjusting the chain extender to manipulate specific glass transition temperature of the viscoelastic polyurethane foam was not a known result-effective variable (see also the Declaration from Dr. Neff). None of the cited references discloses that adjusting the chain extender manipulates the specific glass transition temperature to a use temperature of the viscoelastic polyurethane foam.

The Examiner merely contends that adjusting the chain extender to manipulate the specific glass transition temperature is known because the amount of chain extender may be

varied for the purposes of controlling polymer build-up. It is on this basis that the Examiner concludes it would have been obvious to vary the amount of chain extender to arrive at the claimed invention for the purpose of controlling polymer build-up. However, polymer buildup and the effects of polymer buildup from varying amounts of chain extender have nothing to do with the claimed application, which is likely why the Examiner does not articulate why it would have been obvious to adjust the specific glass transition temperature to coincide with a use temperature of the viscoelastic polyurethane foam.

Claim 1 requires the chain extender in an amount of from 7 to 30 parts by weight based on 100 parts by weight of the foam and the viscoelastic polyurethane foam having the *glass transition temperature of from 5 to 65 degrees Celsius and a tan delta peak of from 0.40 to 1.75*.

Claim 48 requires the chain extender in an amount of from 7 to 30 parts by weight based on 100 parts by weight of the foam and requires the step of *adjusting the amount of the chain extender* to provide the foam with *a glass transition temperature of from 5 to 65 degrees Celsius* corresponding to a use temperature of the foam.

As set forth in paragraphs 5 and 6 of the Declaration, it was discovered by the inventors that the glass transition temperature could be adjusted by manipulating the amount of chain extender present and that increasing the chain extender increases the glass transition temperature of the foam. Example 6 of Lutter et al., when prepared as set forth in Dr. Neff's Declaration with 6 parts by weight of chain extender had a glass transition temperature of 52 degrees Celsius. Thus, the exemplified example of Lutter et al. cited by the Applicant has a high glass transition temperature even though a lower than claimed amount of chain extender is used and it was

discovered that further increasing the chain extender would exceed the *glass transition temperature of from 5 to 65 degrees Celsius*. As set forth in paragraph 17 of the Declaration, increasing the amount of chain extender to adjust glass transition temperature was not recognized for applications in sound proofing materials.

With reference to paragraph 9 of the Declaration, Dr. Neff describes the differences between viscoelastic polyurethane foam used as sound absorbing material versus viscoelastic polyurethane foam that is contacted by user. The glass transition temperature is of little or no significance when used as a sound absorbing material and thus it was not desirable to adjust the glass transition temperature.

However, in the subject invention, the contact by the user changes the properties of the viscoelastic polyurethane foam and requires more control on the specific glass transition temperature of the viscoelastic polyurethane foam. As previously described in the Appeal Brief, it was known to formulate specific resin compositions to provide a specific glass transition temperature for certain foams. It was not known within viscoelastic polyurethane foam arts that generic resins could be used by tailoring the glass transition temperature as a result of adjusting the amount of the chain extenders, as claimed and as discussed in paragraph 8 of the Declaration.

Further, based upon the findings presented in the Declaration and in view of the subject invention, increasing the amount of the chain extender would *further increase* the glass transition temperature resulting in the foam becoming more rigid, i.e., beyond claimed results of the subject application. Therefore, one of ordinary skill in the art, without relying upon impermissible hindsight, would not be motivated to increase the amount of chain extender to arrive at the claimed invention based upon the disclosure of Lutter et al.

Evidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut *prima facie* obviousness. “Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness.” No set number of examples of superiority is required. *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987). Dr. Neff’s Declaration illustrates the flexibility to formulate viscoelastic polyurethane foams from base resin having varying glass transition temperatures by adjusting the amount of the chain extender. Such a discovery was unexpectedly superior to the prior art designer resin that were previously required.

The properties disclosed in Lutter et al. are not the same properties disclosed in the subject application, i.e., sound absorption versus structural support for a user. Lutter et al. is directed toward a viscoelastic polyurethane foams used for sound dampening in structures that is based upon a polyoxyalkylene-polyol mixture of *specially* structured polyoxypropylene-polyoxyethylene polyols, whereas the subject invention is directed toward the choice of the *specific* elements having *specific* characteristics and in *specific* amounts to provide the claimed glass transition temperature and tan delta peak of the viscoelastic polyurethane foam. Thus, based on *Titanium Metals* alone, the Examiner’s rejection relying on Lutter et al. should be withdrawn.

In summary, since the prior art does not disclose that adjusting the chain extender to manipulate specific glass transition temperature is a known result-effective variable, the obviousness rejection relying on the same should be withdrawn.

Closing

For the reasons set forth above, the rejections of Claims 1, 4-5, 7-18, 20-24, 48, 51-52, and 54-58 under 35 U.S.C. §103(a) must be reversed.

**Respectfully submitted,
HOWARD & HOWARD ATTORNEYS, P.C.**

June 18, 2008
Date

/Kristopher K. Hulliberger/
Kristopher K. Hulliberger, Reg. No. 53,047
The Pinehurst Office Center, Suite #101
39400 Woodward Avenue
Bloomfield Hills, MI 48304-5151
(248) 645-1483